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CLAIMS

*Allow B1*

1. Actuator apparatus (10) comprising piston means (18) operable to create driving forces from a supply of pressurised fluid, and valve means (56) operable to supply pressurised fluid to the piston means according to a predetermined sequence, to cause the apparatus to execute a first operation, the valve means and the piston means being housed within a common member (12), and the apparatus being characterised in that the valve means or the piston means or both being removable from the member for replacement by an alternative means operable within the common member to cause the apparatus to execute an alternative operation, and wherein the or each valve means comprise a valve arrangement rotatable within a housing (20), there being ports (64,66,72,82,88, 89,100,104,107) in the housing walls for pressurised fluid, and the valve arrangement carrying partitions (84) which serve to change the connections between the fluid ports in accordance with the predetermined sequence as the valve arrangement rotates, and wherein the valve arrangement of the or at least one of the valve means is axially movable to change the predetermined sequence.

2. Apparatus (10) according to claim 1, characterised in that the valve means (56) is removable for replacement with an alternative valve means operable to supply fluid according to an alternative sequence.

3. Apparatus (10) according to claim 1, characterised in that the valve arrangement (56) has a first axial position at which a wider fluid path is provided to one face of the piston means (18) than to the other, and is movable to a second axial position at which a narrower fluid path is provided to the said one face than to the other.

4. Apparatus (10) according to claim 1, 2 or 3, characterised in that the valve means (56) has a port (96A) having a width which is not constant in the axial direction of the valve arrangement, whereby the effective width of the fluid path to the piston means (18) can be set by setting the axial position of the

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valve arrangement.

5. Apparatus (10) according to any preceding claim, characterised in that the valve arrangement (56) provides drive alternatively to opposite faces of a piston (18) of the piston means, whereby to create reciprocation.

6. Apparatus (10) according to any preceding claim, characterised in that the valve arrangement (56) is formed to complete a plurality of cycles of the piston means (18) for each full turn of the valve arrangement.

7. Apparatus (10) according to claim 6, characterised in that the valve arrangement (56) has a first axial position in which a first number of cycles are completed for each full turn of the valve arrangement and a second axial position in which a different number of cycles is completed for each full term.

8. Apparatus (10) according to claim 7, characterised in that the fluid path to the piston means (18) is relatively narrow in the first axial position, and relatively wide in the second axial position.

9. Apparatus (10) according to any preceding claim, characterised by further comprising intermediate means (30) to which driving forces are provided by the piston means (18), and which convey driving forces to an item (38) being driven.

10. Apparatus (10) according to claim 9, characterised in that the item (38) is an item of tooling or a pile element.

11. Apparatus (10) according to claim 9 or 10, characterised in that the intermediate member (30) provides for movement to align the tooling.

12. Apparatus (10) according to claim 11, characterised in that the alignment movement is provided hydraulically or pneumatically.

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13. Apparatus (10) according to any of claims 9 to 12, characterised in that the intermediate member (30) conveys forces to clamping members (16) by which a workpiece (38) is clamped, in use.
14. Apparatus (10) according to any of claims 9 to 13, characterised in that the clamping members (16) extend at an angle to the intermediate means (30) to allow side or end clamping of a workpiece (38).
15. Apparatus (10) according to any of claims 9 to 14, characterised in that the intermediate means (30) is elongate.
16. Apparatus (10) according to claim 15, characterised in that the intermediate means (30) extends to one side of the common member (12).
17. Apparatus (10) according to claim 14, 15 or 16, characterised in that the clamping members (16) extend substantially perpendicular to the intermediate means (30).
18. Apparatus (10) according to any of claims 9 to 17, characterised in that the intermediate means (30) extend through a passage (107) within the piston means, and have enlarged heads against which the piston means (18) may act in either of two opposite directions.
19. Apparatus (10) according to any preceding claim, characterised by comprising resilient members (57) against which the piston means (18) acts, in use.
20. Apparatus (10) according to claim 19, characterised in that the piston means (18) are isolated by the resilient members (57) from direct impacts, whereby to create vibratory driving forces.
21. Apparatus (10) according to claims 19 or 20, characterised in that the piston means (18) create impact forces when the resilient members (57) are fully

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compressed.

22. Apparatus (10) according to any preceding claim, characterised in that the apparatus is adapted for resilient attachment to a mounting arrangement (15) by means of which the apparatus may be supported by a conventional support arrangement (22).

23. Apparatus (10) according to claim 22, characterised in that the support arrangement (22) is provided by a conventional excavator or like machine.

24. Apparatus (10) according to claim 23, characterised in that the support machine is operable to apply crowd forces to the apparatus.

25. Apparatus (10) according to claim 23 or 24, characterised in that the support machine is able to supply pressurised fluid to the apparatus.

26. Actuator apparatus substantially as described above, with reference to the accompanying drawings.

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